The Thesis Committee for Yee To Ng
Certifies that this is the approved version of the following Thesis:

Friendships in Old Age: Daily Encounters and Emotional Well-being

APPROVED BY
SUPERVISING COMMITTEE:

Karen Fingerman, Supervisor

Marci Gleason

Lisa Neff

Friendships in Old Age: Daily Encounters and Emotional Well-being

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Yee To Ng

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Abstract

Friendships in Old Age: Daily Encounters and Emotional Well-being

Yee To Ng, M.A.

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Supervisor: Karen Fingerman

Having friends in old age is linked to higher levels of happiness and life satisfaction. Yet, we know little about what happens when older adults encounter and engage with friends throughout the day. This study examined whether older adults report a) more pleasantness, b) fewer stressful experiences, and c) better mood when they had contact with friends compared to when they had contact with other social partners or were alone. We also examined whether the closeness of friendships is associated with older adults' daily experiences. Adults aged 65 and older (n = 313) from the *Daily Experiences and Well-being Study* completed an interview including information about their close social partners and their background characteristics. Then, participants reported their encounters with social partners, the pleasantness of these encounters, stressful experiences, and mood every 3 hours for 5 to 6 days using Android devices. Multilevel models revealed that encounters with friends were the most pleasant among all the encounters and were associated with fewer stressful experiences compared to encounters with spouses or family members throughout the day. Encounters with friends also were associated with increased positive mood. Further, encounters with close friends were not associated with better mood whereas

encounters with friends who were not considered close were significantly associated with increased positive mood and reduced negative mood throughout the day. This work facilitates the understanding of how daily contact with friends can promote older adults' momentary well-being.

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INTRODUCTION

Friendships differ from other relationships because these ties are voluntarily chosen and can be disbanded without a formal process or even formal acknowledgement (Adams, Blieszner, & De Vries, 2000). By late life, friendships are highly important because many of these friendships have endured for years (Buhl, 2009; Dugan & Kivett, 1998; Wright & Patterson; 2006) and they may contribute to happiness and a sense of connection (Adam & Taylor, 2015; Aday, Kehoe, & Farney, 2012; Huxhold, Miche, & Schüz, 2013).

Moreover, encounters with friends may differ from encounters with other types of social partners. Functionalist theory distinguishes functions of different types of social partners that may contribute to individuals' well-being (Fingerman, 2009; Litwin & Shiovitz-Ezra, 2010; Messeri, Silverstein, & Litwak, 1993; Wellman & Wortley, 1990). Based on this perspective, friends may serve specific functions that enhance older adults' lives that other social partners do not provide. Prior research has shown that older adults are less likely to experience tensions and conflicts with friends than with their family members (e.g., spouses, children, siblings; Fingerman, Hay, & Birditt, 2004; Sorkin & Rook, 2004), suggesting friends may fulfill older adults' emotional needs differently than other social partners in daily life.

In this study, I examined affective features of older adults' daily experiences with friends (i.e., pleasantness of the encounters, stressful experiences, and mood). Prior

studies have used retrospective reports on the general quantity and quality of friendships in late life (Aday et al., 2012; Chopik, 2017; Huxhold et al., 2013; for review see Pinquart & Sörensen, 2000). Yet, we know little about day-to-day experiences with friends among older adults. Specifically, assessing older adults' daily experiences may capture feelings and emotional experiences that may not be readily recalled in retrospective reports, but are crucial to the understanding of how friendships influence older adults' momentary well-being (Charles et al., 2016; Trull & Ebner-Priemer, 2009).

Daily Experiences with Friends

Encounters with friends. Encounters with friends are common in older adulthood. Studies find that, on average, older adults report having contact with a friend at least once a week (Nicolaisen & Thorsen; 2017; Nguyen, Chatters, Taylor, & Mouzon, 2016; Taylor, Chae, Lincoln, & Chatters, 2015). Data from the 2011–2015 American Time Use Survey also revealed that the amount of time older adults spent with their friends per day averaged 30 to 50 minutes (U.S. Bureau of Labor Statistics, 2016). Indeed, older adults may reach out to their friends partially because of the losses of family members (e.g., spouses, parents, siblings) due to death as well as opportunities to engage with old friends or create new friendships when they retire (Chatters, Taylor, Nicklett, & Taylor, 2018; Johnson & Troll, 1994).

It is interesting to note that some older adults may have long-lasting friends whom they rarely see in their daily lives (Fingerman & Griffiths, 1999; Matthews, 1986) but

they include these "latent" friends in their supportive networks (Shea, Thompson, & Blieszner, 1988). We recognize these friendships may also have an impact on older adults' well-being, but the current study focused on daily friendship experiences that may be associated with older adults' momentary well-being.

Pleasantness and stressful experiences. Older adults' encounters with friends are likely to be pleasant experiences. According to socioemotional selectivity theory, older adults tend to engage in behaviors that maximize pleasant experiences and minimize negative experiences with their social partners (Carstensen, 2006; Charles & Carstensen, 2010). Unlike family relationships which cannot be terminated easily, the voluntary nature of friendships allows older adults to dissolve unsatisfactory or problematic friendships from their networks (Blieszner & Adams, 1998; Blieszner & Roberto, 2004). Likewise, the social convoy model suggests some social partners may drop out due to choices or to external circumstances throughout the life course. These network partners (e.g., friends) may either be replaced by new or existing members, or may not be replaced, causing the convoy to shrink in size (Antonucci, Ajrouch, & Birditt, 2014). As such, it is likely that many enduring friendships in late life are among the strongest and most rewarding ties.

Research regarding stressful experiences or tensions with friends is mixed. Research finds that older adults experience more tensions with non-family members (e.g., friends, neighbors, coworkers, service providers, acquaintances) than with family members (e.g., spouses, children or other relatives; Birditt, Fingerman, & Almeida,

2005). However, studies that differentiate friends from co-workers or service providers find it is the latter who cause aggravation (Fingerman et al., 2004; Milardo, 1989). Indeed, friends share more similarities (e.g., demographic characteristics, values, behaviors, and experiences; Blieszner & Adams, 1992; Flatt, Agimi, & Albert, 2012) than non-friends. As such, friends may be less likely to disagree with each other than non-friends. Based on these theories and studies, I expected that older adults would report greater pleasantness and fewer stressful experiences in their encounters with friends compared to their encounters with other social partners.

Positive and negative mood. I also examined whether encounters with friends were associated with older adults' mood throughout the day. Prior studies relying on retrospective surveys found that contact with friends was linked to better subjective well-being in older adulthood (e.g., happiness and life satisfaction; Fiori, Smith, & Antonucci, 2007; Wrzus, Wagner, & Neyer, 2012; for review see Pinquart & Sörensen, 2000). It is likely that having encounters with friends will also be associated with better mood throughout the day because of the voluntary nature of friendships, sense of connection, as well as in part due to the pleasant experiences that these encounters elicit.

Scant data have linked older adults' encounters with friends to better mood throughout the day. In one of the earliest daily experience studies, Larson and his colleagues (1986) paged older adults at a random time within every 2-hour block. They found that participants reported more positive mood when they were with friends than when they were alone or with other social partners. Although the evidence is sparse, I

predicted that having encounters with friends would be associated with better mood throughout the day.

Closeness of Friendships

Throughout adulthood, individuals typically have friendships that vary in closeness (Gächter, Starmer, & Tufano, 2015). Prior research has shown that most older adults are committed to a few longest standing friendships, but some older adults continue to form new friendships in old age that differ in emotional closeness from their enduring friendships (Field, 1999; Huxhold et al., 2013; Matthews, 2000). Seemingly, older adults may have different reactions to daily encounters with friends of varying degrees of closeness.

Close friends may influence older adults' emotional well-being more than less close friends. The social convoy model suggests that close social partners are most likely to provide support and affirmation which have decisive and significant influences on well-being (Antonucci et al., 2014). Similarly, studies have found that older adults who have close friends or feel close to their friends report better well-being than older adults who have only casual friends or feel less close to their friends or no friends (Fiori et al., 2007; Litwin & Shiovitz-Ezra, 2010; Nguyen et al., 2016). As such, I predicted that older adults would report greater levels of pleasantness, fewer stressful experiences, and better mood when they had daily encounters with closer friends (i.e., friends in their social

convoy; Antonucci et al., 2014) than when they had encounters with less close friends (friends who were not listed in their social convoy).

Other Factors Associated with Encounters and Experiences with Friends

This study adjusted for several participants' demographic factors that may be associated with daily experiences with friends: age, gender, socioeconomic status (SES), ethnic/racial minority status, and health status. With age, individuals report fewer friends (Gillespie, Lever, Frederick, & Royce, 2015; Kalmijn, 2003; Litwin, 2003) or have less contact with friends (Carstensen, 1992; Shaw, Krause, Liang, & Bennett, 2007). Women have more frequent contact with friends than men (de Jong Gierveld, 2003; Kalmijn, 2003). Compared to lower SES individuals, upper SES individuals have more friends and spend more time with friends (Bianchi & Vohs, 2016). Further, African Americans and Hispanics report fewer close friends and are less involved in friendship networks than non-Hispanic White Americans (Hedegard, 2017; McPherson, Smith-Lovin, & Brashears, 2006; Taylor, Taylor, & Chatters, 2016). Better health is associated with more frequent contact with friends among older adults (Ha, Kahng, & Choi, 2017). Beyond participants' demographic factors, I also adjusted for the proportion of friends in the overall social convoy; that is, among all the social partners listed in the convoy, what proportion were friends.

The Current Study

The current study focuses on friendships in old age. I examined whether older adults reported higher levels of pleasantness, fewer stressful experiences, and better mood when they had encounters with friends compared to with spouses, family members, or other social partners. I further explored whether the closeness of friends would influence their daily experiences. I tested the following hypotheses:

Compared to encounters with spouses, family members, or other social partners throughout the day, I expected:

Hypothesis 1: Older adults would evaluate encounters with friends as more pleasant.

Hypothesis 2: Older adults would be less likely to report stressful experiences in their encounters with friends.

Hypothesis 3: Older adults would report higher positive and lower negative mood when they had encounters with friends.

I further examine the closeness of friendships. Compared to encounters with less close friends throughout the day, I expected:

Hypothesis 4a: Older adults would evaluate encounters with their close friends as more pleasant.

Hypothesis 4b: Older adults would be less likely to report stressful experiences in their encounters with their close friends.

Hypothesis 4c: Older adults would report higher positive and lower negative

mood when they had encounters with their close friends.

METHODS

Participants and Procedures

The current study used data from the *Daily Experiences and Well-being Study* (DEWS) collected from October 2016 to April 2017. This study included 333 older adults aged 65 and older who resided in the Greater Austin area, Texas (including the urban, suburban, and rural areas). Inclusion criteria involved residing in the community and not working full-time for pay.

Participants completed a 2-hour initial interview ("global interview") and then completed ecological momentary assessments (EMA) reporting on their social involvement and affective experiences every 3 hours across 5 to 6 days. They received $50 for completing the global interview and $100 for completing the 5 to 6-day EMA.

Among the 333 older adults who completed the global interview, 313 older adults (aged 65–90, M_{age} = 73.94, SD = 6.38), participated in the EMA. Compared to the other 20 participants who were not part of the daily data collection, these 313 participants were less likely to identify as an ethnic or racial minority (t = 2.70, p = .007) but they did not differ on other background characteristics or proportion of friends in the social convoy. Table 1 and Table 2 summarize participants' demographic and daily experiences information respectively.

Global Interview Measures

Participants completed a global interview in their homes or a location of their choice. In this interview, participants provided their background information (e.g., age, gender, education, marital status, ethnic/racial minority status, and health status) and reported information about their close social partners.

Social convoy. In the global interview, participants listed their close and important social partners in three concentric social convoy circles (Antonucci, 1986). Participants provided names of people they: (a) feel so close to that it is hard to imagine life without them (i.e., innermost circle), (b) may not feel quite that close to, but who are still very important to them (i.e., middle circle), and (c) have not already mentioned but who are close enough and important enough in their lives that they should also be included in the circle (i.e., outermost circle). To avoid fatigue, participants answered additional questions for up to 10 of their closest social partners (Antonucci et al., 2014; Fiori et al., 2007). Participants specified their relationship to up to 10 social partners (e.g., spouses, children, siblings, friends). I generated a categorical variable to indicate relationship types, 1 (*friends*), 2 (*spouses*, *romantic partners*, *boyfriends/ girlfriends/ significant others*, *cohabitors*), 3 (*family members*; e.g., parents, children, siblings, grandchild; Fiori et al. 2007), and 4 (*other social partners*; e.g., acquaintances, other relatives/extended family members, coworkers, neighbors, church members).

Control variables. Covariates regarding the participants were assessed in the global interview. Participants reported their age, gender 1 (*male*) and 0 (*female*), marital

status recoded as 1 (*married/remarried*) and 0 (*not married*), ethnic/racial minority status recoded as 1 (*ethnic/racial minority*) and 0 (*non-Hispanic White*), and health status rated from 1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*; Idler & Kasl, 1995). In this study, I used the level of education as an indicator of socioeconomic status. Participants indicated their education level from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate),* 7 (*post college but no additional degree*) to 8 (*advanced degree*). I also generated a variable to indicate the proportion of friends in the overall social convoy.

Ecological Momentary Assessment (EMA) Measures

In the 5 to 6 days EMA data collection, older adults reported their encounters with social partners, the pleasantness of these encounters, stressful experiences, and mood every 3 hours during waking hours throughout the day (e.g., approximately 7 am to 11 pm) using a handheld Android device provided by the study. Therefore, they were expected to complete 5 assessments per day. On average, participants completed 20.00 (*SD* = 6.03, ranged from 1–32) assessments across the study period. Further, participants completed an average of 3.78 (*SD* = 1.42, ranged from 1–6) assessments per day. Based on this expectation, participants missed an average of 1.30 (*SD* = 0.83) reports per day. Approximately half of the sample (51%) completed at least an average of 4 assessments per day across the study period, but 1.3% of the participants completed only one assessment per day on average.

Encounters with social partners. In this study, to avoid fatigue or task overloading, participants reported their social encounters during the prior 3 hours in every 3-hour interval rather than reported their social encounters at the moment. Every 3 hours, participants reported whether they had any social encounters with each of their 10 closest social partners (i.e., "the top 10") during the prior 3 hours. Participants also reported on whether they had social encounters with anyone who was not listed in that top 10 (i.e., non-convoy social partners) during the prior 3 hours. Participants reported up to 6 social partners who were not listed in the social convoy and answered additional questions such as their relationship to that social partner (i.e., family member, friend, acquaintance, service provider, stranger, other). I treated the non-convoy family members in the category of family members, non-convoy friends as friends, and the remaining non-convoy social partners (i.e., acquaintance, service provider, stranger, other) as other social partners. I then generated dummy variables from the categorical variable of relationship type to indicate whether each encounter was with a friend 1 (*yes)* and 0 (*no*), a spouse 1 (*yes)* and 0 (*no*), a family member 1 (*yes)* and 0 (*no*), or another social partner 1 (*yes*) and 0 (*no*).

Participants also indicated how they interacted with each of their social partners: in person 1 (*yes)* and 0 (*no*), via text 1 (*yes)* and 0 (*no*), and via phone 1 (*yes)* and 0 (*no*). These types of contact were not mutually exclusive. Participants could indicate they had encountered with a social partner in person, via text, and via phone in the prior 3 hours.

For analyses involving friendship closeness, I compared encounters with friends listed in the social convoy in the global interview to encounters with friends who were not listed in the social convoy. I generated a variable to indicate closeness 1 (*social convoy friend*) and 0 (*non-convoy friend*).

Pleasantness of the encounter. If participants indicated they had an encounter with anyone in the prior 3 hours, a follow-up question asked 'How pleasant was this interaction for you?'. They rated the encounter 1 (*unpleasant*), 2 (*a little unpleasant)*, 3 (*neutral*), 4 (*a little pleasant*) to 5 (*pleasant*).

Stressful experiences. If participants indicated they had an encounter with anyone in the prior 3 hours, another follow-up question asked 'Did you discuss anything that might be considered stressful or unpleasant?' Participants answered 1 (*yes*) or 0 (*no*).

Mood. Participants rated their positive and negative mood during the prior 3 hours. They rated the extent to which these mood items describe them: four positive mood items (i.e., calm, love, content, proud) and five negative mood items (i.e., nervous/worried, irritated, bored, lonely, sad) on a scale from 1 (*not at all*) to 5 (*a great deal;* Fingerman, Kim, Birditt, & Zarit, 2016; Watson, Clark, & Tellegen, 1988). I calculated averages to generate positive mood score (α = .69) and negative mood score (α = .72).

ANALYTIC STRATEGY

First, I examined descriptive information regarding older adults' daily experiences. I estimated the proportion of assessments out of their 3-hour reports in which older adults had encounters with friends, spouse, family members, and other social partners. I also examined bivariate correlations between daily experiences (e.g., pleasantness of encounter, 3-hour mood) and participants' demographic characteristics (e.g., age, education, gender). To do so, I used participant-level data which was generated from the aggregations of the 3-hour reports. I calculated mean scores for the pleasantness of encounters and stressful experiences across encounters for each participant. Because mood was assessed every 3 hours, I generated mean scores for positive and negative mood ratings across 3-hour assessments for each participant, and then reported sample averages from participant averages.

In the first two hypotheses, I asked whether older adults' encounters with friends throughout the day were more pleasant and were less likely to involve stressful experiences compared to encounters with spouses, family members, or other social partners. Participants rated the pleasantness and reported any stressful experience with each social partner they encountered throughout the day.

I estimated multilevel models to take into account the three-level structure of our data: encounters with different social partners (*level 1*), nested within 3-hour assessment intervals (*level 2*), and nested within participants (*level 3*). I treated the rating of pleasantness 1 (*unpleasant*) to 5 (*pleasant*) and any stressful experience 1 (*stressful*

experience) and 0 (*no stressful experience*) with each social partner as the outcomes. The predictor was a categorical variable in which the social partner was coded as: friend, spouse, family member, or another person. I treated encounter with a friend 1 (*yes*) and 0 (*no*) as a reference group and entered the other three relationship types (i.e., spouse, family member, and another person) as dummy coded predictors in the models. To assess differences between these social ties' associations with the rating of pleasantness and stressful experiences, I tested all pairwise comparisons of means with Tukey adjustments after running the models.

In the first model, I used multilevel linear models with SAS PROC MIXED for the continuous outcome (i.e., the rating of pleasantness) and multilevel logistic models with SAS PROC GLIMMIX for the binary outcome (i.e., any stressful experiences, Guo & Zhao, 2000). The three-level models controlled for participant-level variables: age, gender, level of education, health status, minority status, and proportion of friends in the overall social convoy (assessed in the global interview). I did not include marital status as a covariate due to the high correlation between marital status and encounters with spouses ($r = .88$, $p < .001$) and the possible problems with multicollinearity. Before running the models, I grand mean centered the control variables: age, level of education, health status, and proportion of friends; and effect coded for gender and minority status to make the intercepts more interpretable. An example equation for three-level models is as follows:

$$\textit{Pleasantness of encounter}_{ijk} = \gamma_{000} + \gamma_{100}(\text{spouse}_{ijk})$$

$$+ \gamma_{200}(\text{family member}_{ijk})$$

$$+ \gamma_{300}(\text{another person}_{ijk})$$

$$+ \gamma_{001}(\text{age}_k) + \gamma_{002}(\text{gender}_k) + \gamma_{003}(\text{education}_k) + \gamma_{004}(\text{health status}_k)$$

$$+ \gamma_{005}(\text{minority status}_k) + \gamma_{006}(\text{proportion of friends}_k)$$

$$+ v_{00k} + u_{0jk} + e_{ijk}.$$

In this equation, *k* refers to the participant level, *j* the 3-hour assessment level, and *i* the encounter level. $Pleasantness_{ijk}$ refers to participant *k*'s pleasantness rating at the j^{th} assessment with the i^{th} social partner. The intercept γ_{000} refers to participants' rating of pleasantness for the encounter when all variables equal 0. The coefficient γ_{100} represents how having an encounter with a spouse may associate with the rating of pleasantness. γ_{200} represents how having an encounter with family members may associate with the rating of pleasantness. γ_{300} represents how having an encounter with other social partners may associate with the rating of pleasantness. γ_{001} to γ_{006} refer to the coefficients for participant-level control variables. v_{00k} is the error term for participant k, u_{0jk} refers to the error term accounting for assessment, and e_{ijk} is the error term accounting for encounter. These error terms represent the residual variances that are not explained by the predictors and control variables.

To test the next hypothesis, whether older adults' encounters with friends throughout the day were associated with better mood compared to encounters with spouses, family members, or other social partners, I estimated two-level models with 3-hour assessment intervals (*level 1*) nested within participants (*level 2*). This set of

analyses was different from the analyses for rating of pleasantness or stressful experience with each social partner. Specifically, I dropped the encounter level because we only assessed older adults' mood at 3-hour assessment intervals instead of assessing mood following every encounter. Participants could report encounters with multiple social partners at each 3-hour assessment. Although each social partner was coded into one type of relationship (e.g., friends, spouse, family, other partner), these categories were not exclusive in predicting mood. Participants could encounter all four types of social partners during a given 3-hour interval. Thus, I generated four variables to indicate whether there were any encounters with each different type of social partner during the prior 3 hours with: friends 1 (*yes)* and 0 (*no*), spouses 1 (*yes)* and 0 (*no*), family members 1 (*yes)* and 0 (*no*), and other social partners 1 (*yes)* and 0 (*no*). These dichotomous variables represent any encounter with any person in that category (i.e., with any friend) rather than the number of social partners encountered. I entered these four variables for types of relationships as the predictors in the models. To examine differences between these relationship types, I conducted pairwise comparisons using *t*-tests to determine whether the coefficients for relationship types (i.e., the link between the relationship type and mood) significantly differed from one another.

I used multilevel linear models with SAS PROC MIXED treating older adults' positive and negative mood as continuous outcomes in two separate models. The models examining mood controlled for the same covariates as in the models examining pleasantness and stressful experiences.

$$mood_{ij} = \gamma_{00} + \gamma_{10}(\text{friends}_{ij}) + \gamma_{20}(\text{spouses}_{ij}) + \gamma_{30}(\text{family members}_{ij}) + \gamma_{40}(\text{other social partners}_{ij}) + \gamma_{01}(\text{age}_j) + \gamma_{02}(\text{gender}_j) + \gamma_{03}(\text{education}_j) + \gamma_{04}(\text{health status}_j) + \gamma_{05}(\text{minority status}_j) + \gamma_{06}(\text{proportion of friends}_j) + u_{0j} + e_{ij}.$$

In this equation, $mood_{ij}$ refers to participant k's mood reported on the i^{th} assessment. The intercept γ_{00} refers to participants' mood when all variables equal 0. The coefficient γ_{10} represents how having encounters with friends may associate with older adults' mood. γ_{20} refers to how having encounters with spouses may associate with older adults' mood. γ_{30} refers to how having encounters with family members may associate with older adults' mood. γ_{40} refers to how having encounters with other social partners may influence older adults' mood. γ_{01} to γ_{06} refer to the coefficients for participant-level control variables. u_{0j} is an error term at the participant level. e_{ij} is an error term at the assessment level.

The final set of hypotheses pertained to how the closeness of friendships may influence older adults' rating of pleasantness of the encounters, stressful experiences, and mood. To test whether older adults would report more pleasantness and fewer stressful experiences when they had encounters with close friends compared to encounters with less close friends throughout the day, I estimated three-level multilevel models with

encounters (*level 1*), nested within 3-hour assessment intervals (*level 2*), and nested within participants (*level 3*). In these analyses, I selected encounters when participants reported encounters with friends and excluded the times when participants reported encounters with other groups of social partners or no encounters at all. The predictor was a dichotomous variable that represented whether the friendship was considered close, based on placement in the convoy: 1 (*social convoy friends*) and 0 (*non-convoy friend).* As in the prior analyses, I repeated multilevel linear models with SAS PROC MIXED for the continuous outcome of pleasantness rating; and multilevel logistic models with SAS PROC GLIMMIX for the binary outcome of stressful experiences when examining closeness of friendships. I also controlled for variables used in the prior analyses.

Finally, to test whether older adults reported better mood when they had encounters with their closest friends (listed in the convoy) compared to when they had encounters with less close friends (not listed in the convoy) throughout the day, I estimated two-level models with 3-hour assessment intervals (*level 1*) nested within participants (*level 2*). As in the previous analysis for mood, participants could encounter multiple friends in the same 3-hour interval. Thus, I generated two variables to indicate whether older adults had any encounters during the prior 3 hours with: social convoy friends 1 (*yes)* and 0 (*no*) and non-convoy friends 1 (*yes*) and 0 (*no*). Next, I entered these two variables as predictors and ran multilevel linear models using SAS PROC MIXED treating older adults' positive mood and negative mood as continuous outcomes in two separate models. I controlled for participant characteristics described in the prior models.

Because participants could encounter multiple other social partners in the same 3-hour interval, I also controlled for the encounters with spouses, family members, and other social partners in the models. Finally, I conducted a pairwise comparison using *t*-test to investigate whether the coefficients of the convoy friendships and the non-convoy friendships for mood significantly differed from one another.

RESULTS

Approximately 60% of older adults (n = 193) listed at least one friend in their social convoy. Compared to the 120 participants who did not list any friends in their social convoy, these 193 participants were less likely to be married/cohabitating (53.4% compared to 67.5%, t = 2.49, p = .013) or identify as an ethnic or racial minority (21.8% compared to 45.8%, t = 4.61, p < .001; not shown in table). The total sample of older adults (n = 313) listed an average of 2.10 (SD = 2.30) friends in their social convoy, representing 17 % of their overall social convoy members (Table 1). However, among the 193 older adults who listed at least one friend in their social convoy, they listed an average of 3.40 (SD = 2.02) friends in their social convoy and friends represented 27% of their overall social convoy members (not shown in table).

Nevertheless, more than 90% of older adults (n = 286) encountered at least one friend during the 5 to 6 days intensive data collection period, reflecting encounters with friends who were not listed in the social convoy friends as well as friends who were listed in the social convoy. Compared to the other 26 participants who did not encounter any friends, these 286 participants were better educated ($M_{education286}$ = 5.97 compared to $M_{education26}$ = 5.00, t = -2.97, p = .003), less likely to identify as an ethnic or racial minority (28.7% compared to 45.8%, t = 3.10, p = .002), and listed a greater number of social partners in their overall social convoy ($M_{socialpartner286}$ = 15.50 compared to $M_{socialpartner26}$ = 10.88, t = 3.29, p = .001; not shown in table). Analyses were conducted for

the entire sample (n = 313) and repeated for the large subsample who encountered at least one friend (n = 286).

Among all the encounters with friends, 32% of these encounters involved friends listed in the social convoy, and 68% of these encounters were with non-convoy friends. Further, during the 5 to 6 days intensive data collection, the total sample of older adults (n = 313) reported encounters with one or more friends during 31% of their 3-hour assessments. The subsample of participants who encountered at least one friend (n = 286) reported encounters with one or more friends during 33% of their 3-hour assessments.

I estimated bivariate correlations at the participant level. I examined encounters with friends throughout the day and characteristics of older adults for the entire sample (n = 313). Findings revealed that older adults who had a greater proportion of 3-hour assessments involving encounters with friends were more likely to be female, better educated, in better health, not married/cohabited, non-Hispanic White, and have a higher proportion of friends in the overall social convoy (Table 3).

I also examined bivariate correlations among variables reflecting daily experiences: correlations between encounters with friends and: a) encounters with other social partners, b) affective experiences with social partners (i.e., pleasantness of the encounter, stressful experiences), and c) positive and negative mood. These findings revealed that having encounters with friends was negatively correlated with encounters with spouses but positively correlated with encounters with other social partners (See Table 3). No significant bivariate correlations between encounters with friends and

affective experiences or mood were found.

I repeated analyses for a) the subset of participants who encountered at least one friend during the study period (n = 286) and b) the subset of participants who had listed at least one friend in their convoys (n = 193). The patterns of findings were basically the same (not shown in table).

Hypotheses Testing

Pleasantness of the encounters. I asked whether older adults evaluated encounters with friends as more pleasant compared to encounters with spouses, family members, or other social partners throughout the day. As expected, the three-level linear model revealed that older adults viewed their encounters with friends as more pleasant compared to their encounters with spouses (B = -0.04, p = .007), family members (B = -0.06, p < .001), or other social partners (B = -0.23, p < .001) throughout the day (Table 4). Here, compared to all other types of relationships, encounters with other social partners were the least pleasant throughout the day. Table 5 shows findings from pairwise comparisons of the other relationships using Tukey's adjustment.

Stressful experiences. I also asked whether older adults were less likely to have stressful experiences in their encounters with friends compared to in their encounters with spouses, family members, or other social partners throughout the day. As shown in Table 6, a three-level logistic model revealed that older adults were more likely to report stressful experiences in their encounters with spouses (odd ratio = 1.22, p = 0.03) or in

their encounters with family members (odd ratio = 1.34, $p = .002$) compared to encounters with friends throughout the day. Yet, older adults were *less* likely to report stressful experiences in their encounters with other social partners than in their encounters with friends (odd ratio = 0.68, $p < .001$). Here, compared to all other types of relationships, older adults reported the least stressful experiences in their encounters with other social partners throughout the day. Pairwise comparisons of stressful experiences among other relationships using Tukey's adjustment are also presented in Table 5.

Associations with mood. I then explored how encounters with friends were associated with older adults' mood throughout the day. Participants might have encountered multiple types of social partners in any 3-hour period. Thus, in these analyses, I entered variables representing whether the participant had any encounters with each type of relationship. As shown in Table 7, a two-level linear model revealed that encounters with friends ($B = 0.08$, $p < .001$) was significantly associated with increased positive mood throughout the day. Consistent with the significant associations in Table 7, pairwise comparisons using *t*-tests revealed that encounters with friends were more strongly associated with positive mood than encounters with other social partners ($t = 0.08$, $p < .001$; Table 8). For other patterns of associations, see also Table 8.

With regard to negative mood, I expected encounters with friends would be associated with lower negative mood throughout the day. However, findings revealed that encounters with friends were not significantly associated with negative mood throughout the day ($B = -0.01$, $p = .24$; Table 7). Table 8 shows the pairwise comparisons using *t*-

tests among other relationships.

Closeness of friendships. I re-estimated the models above and considered the role of closeness of friendships. Findings revealed that older adults did not significantly report greater levels of pleasantness (B = -0.04, p = .13; not shown in tables) or fewer stressful experiences (B = 0.26, p = .10; not shown in tables) when they had encounters with social convoy friends (i.e., close friends) compared to encounters with non-convoy friends (i.e., less close friends) throughout the day.

With regard to mood, interestingly, as shown in Table 9, encounters with non-convoy friends were significantly associated with increased positive mood (B = 0.09, p < .001) and reduced negative mood (B = -0.02, p = .02), even after controlling for encounters with spouses, family members, and other social partners. The *t*-tests that compared the effect sizes for encounters with convoy friends and encounters with non-convoy friends further revealed that encounters with non-convoy friends were more strongly associated with higher positive mood (t = 0.07, p = .004; Table 10) than encounters with convoy friends, but the *t*-tests for negative mood was not significant (t = -0.03, p = .07; Table 10).

Post Hoc Tests

I additionally repeated the analyses by selecting a) a subset of participants who encountered at least one friend during the study period (n = 286) and b) a subset of participants who had listed at least one friend in their convoys (n = 193). Overall, the

patterns of findings were consistent for friendships and affective experiences (i.e., pleasantness of the encounter and stressful experiences) or positive and negative mood when I limited the sample to subsets of older adults who encountered at least one friend throughout the study (see Table 11 to 15)or who had at least one friend in the convoy (see Table 16 to 20).

Being alone is subsumed in the analyses assessing older adults' mood (i.e., 0 (*no*) for each relationship included periods when the participant was alone). Nevertheless, I also repeated the analyses limiting assessments of mood to the 3-hour intervals when participants encountered at least one social partner. The patterns of findings held (see Tables 21 and 22).

Daily experiences with friends also may vary depending on marital status, with older adults who lack a spouse experiencing more frequent encounters with friends and stronger emotional reactions to these encounters. As such, I looked at whether marital status moderated the associations between encounters with friends and ratings of pleasantness of the encounter, stressful experiences, or mood. I generated an interaction term (i.e., encounters with friends × marital status) and estimated three-level linear models with the pleasantness of the encounters as the outcome and three-level logistic models with stressful experiences as the outcome. Regarding mood, I estimated two-level linear models with positive and negative mood as separate outcomes. These models controlled for the participant level control variables in prior analyses, I further controlled the encounters with family members, and other social partners. I did not control the

encounters with spouses when I included marital status as the moderator in the model due to the high correlation between marital status and encounters with spouses (r = .88, p < .001). Findings revealed that there were significant interaction effects of older adults' marital status and encounters with friends on the rating of the pleasantness (B = -0.06, p = .02; Table 23) and positive mood (B = -0.09, p < .001; Table 24). Simple slopes analyses revealed that not married older adults (B = 0.16, p < .001) reported significantly greater pleasantness when they encountered with friends than married older adults (B = 0.10, p < .001; see Figure 1). Further, encounters with friends significantly elicited more positive mood for not married older adults (B = 0.13, p < .001) than married older adults (B = 0.04, p = .03; see Figure 2). I did not observe significant interaction effects of encounters with friends × marital status on stressful experiences with friends (B = -0.13, p = .41; Table 23) or negative mood (B = -0.02, p = .25; Table 24).

DISCUSSION

Past research has shown positive effects of friendships on older adults' well-being. Yet, most research has focused on the retrospective report associating the benefits with the number of friends or relationship quality of friendships (Chopik, 2017; Huxhold et al., 2013; for review see Pinquart & Sörensen, 2000). Limited studies have examined friendship experiences throughout the day (Larson et al, 1986; Zhaoyang, Sliwinski, Martire, & Smyth, 2018). Using an ecological momentary assessment approach, we found that contact with friends was common in older adults' daily lives. We also found that encounters with friends were the most pleasant among all social encounters, were less likely to have stressful experiences than encounters with spouses or family members, and were associated with increased positive mood throughout the day. We also broke new ground by exploring whether the closeness of friendships matter in older adults' affective experiences and mood. Interestingly, encounters with close friends were not associated with better mood whereas encounters with less close friends contributed to older adult's better mood throughout the day. Together, these findings provide compelling evidence of how friendships uniquely contribute to older adults' emotional well-being.

Encounters with Friends and Daily Experiences

Pleasantness and stressful experiences. The current study supports our hypothesis that older adults reported greater pleasantness during their encounters with friends than during encounters with spouses, family members, or other social partners.

Indeed, socioemotional selectivity theory predicts that close social partners (e.g., family members, friends) among older adults generate more positive emotional experiences than acquaintances do (Charles & Carstensen, 2010). Consistent with this theory, we found that encounters with friends were the most pleasant whereas encounters with other social partners (e.g., acquaintances, extended family members, coworkers, neighbors, church members) were the least pleasant among all the social encounters. Our findings suggest that the pleasantness ratings were not merely a reflection of the divide between family members and non-family members (Birditt et al., 2005). Rather, friends seem to evoke particular pleasantness that social partners outside the family who are not friends do not evoke.

Our findings also revealed that older adults were less likely to have stressful experiences in their encounters with friends than in their encounters with spouses or family members. These findings offer additional support for the relational ambivalence literature (Connidis, 2015; Fingerman et al., 2004; Krause & Rook, 2003; Sorkin & Rook, 2004; Morgan, 1989), that suggests contact with friends is less likely to be a source of negative exchanges in late life than family members. Nevertheless, we were surprised to find that encounters with other social partners (who were not family or friends) were even less likely to involve stressful experiences than encounters with friends or family members. This lower rate of tension may reflect a lack of investment and commitment in these distal social partners, such that older adults do not bother to raise annoying issues or

generate conflicts with these distal social partners (Fingerman, 2009; Spitzberg, & Cupach, 2013).

Mood. Consistent with prior retrospective studies that showed contact with friends is linked to better subjective well-being in older adulthood (Wrzus et al., 2012; Pinquart & Sörensen, 2000), we found that encounters with friends, spouses, and family members were associated with increased positive mood throughout the day. However, the current study assessed the co-occurrence of social partners which also influenced older adults' mood. Findings revealed that encounters with friends were more strongly associated with positive mood than encounters with other social partners. However, associations between encounters with friends and positive mood did not differ significantly from associations between encounters with spouses or family members and positive mood. It appears to be the case that both encounters with friends and family members play a role in enhancing positive mood among older adults (Dupertuis, Aldwin, & Bosse, 2001; Fiori et al., 2006; Huxhold et al., 2013).

Surprisingly, we did not observe a reduction in negative mood when older adults encountered friends. Generally, older adults report experiencing lower levels of negative affect across settings, and as such, between- and within-person variability in negative mood may be low (Charles, Piazza, Luong, & Almeida, 2009; Kessler & Staudinger, 2009; Kunzmann, Little, & Smith, 2000). Our findings imply that encounters with friends help boost older adults' positive mood rather than reduce low levels of negative mood.

Closeness of Friendships and Daily Experiences

As noted earlier, socioemotional selectivity theory suggests older adults tend to retain their closest social partners and engage more often with these close partners (e.g., close family and close friends; Lang & Carstensen, 1994; Charles & Carstensen, 2010). Likewise, older adults are expected to engage more often with close friends than less close friends. Surprisingly, our findings revealed that older adults were more likely to encounter friends who were not listed as members of their social convoys (i.e., less close friends) than friends who were listed in the convoys (i.e., close friends; 68% compared to 32% among all the encounters with friends). This finding provides evidence that there are some "latent'' friends older adults view them as important but do not have frequent daily contact.

In contrast to the social convoy literature that documents the influential role of social convoy partners on one's well-being (Antonucci et al., 2014; Antonucci, Fiori, Birditt, & Jackey, 2010), our findings revealed that, older adults did not significantly rate their encounters with social convoy friends as more pleasant or report fewer stressful experiences than encounters with non-convoy friends. However, interestingly, we found that encounters with non-convoy friends were associated with increased positive mood and reduced negative mood. These findings add support to the literature on the importance of peripheral ties, which suggests less close ties are beneficial to individuals in terms of social integration, diverse activities, and novelty (Fingerman, 2009; Fingerman, Brown, & Blieszner, 2011). Indeed, associations between encounters with

non-convoy friends and better mood may be due to the potential novel experiences involved in these encounters, compared to more routine activities with closer friends and family. Several studies have documented that novelty is associated with happiness (Berlyne, 1970; Buchanan & Bardi, 2010; Churchyard & Buchanan, 2017). Our findings parallel those studies by revealing that contact with less close friends (who may be sources of novelty or encourage novel behaviors) was associated with better mood among older populations.

Friendship Experiences and Marital Status

Most research suggests that older adults who are not married (e.g., single, divorced, widowed) have more friends on average (Gillespie et al., 2014) and are more likely to socialize (Ha, 2008; Kalmijn, 2003; Sarkisian & Gerstel, 2016) and exchange help with friends than their married counterparts (Leibler & Sandefur, 2002; Sarkisian & Gerstel, 2016). Therefore, friendships may be of particular relevance and have greater influence for not married older adults than married older adults. Our findings showed that not married older adults reported greater pleasantness when they encountered with friends than married older adults. Having contacts with friends also elicited greater positive mood throughout the day for not married older adults than married older adults. These findings add support to the idea that friendship experiences varied by older adults' marital status.

Limitations and Future Directions

Limitations of this study should be addressed in future research. First, this study was conducted on an older population. It is unclear whether the findings would generalize to younger populations. Generally, older adults tend to prioritize current emotional gratification and meaning whereas younger adults are more motivated to pursue long-term rewards such as gaining new experiences and knowledge, and expanding social networks (Carstensen, 2006; Carstensen, Isaacowitz, & Charles, 1999). Such differences in values and preferences between older and younger adults may have an impact on how friends influence individuals' emotional well-being. For example, younger adults may continue to socialize with friends who cause unpleasant experiences because these friends may provide them with new information or knowledge.

Second, our measures used subjective friendship definitions. We did not include follow-up questions to understand each participant's subjective definition of friendship. Indeed, prior research suggests older adults have a varied understanding of friendships (Adam et al., 2000; Johnson & Troll, 1994). Notably, some older adults may view their closest friends as family members (e.g., "fictive kin", "logical kin" in contrast to biological kin). Moreover, older adults may feel close to friends who are not listed in their convoys. As such, future research needs to pay more attention to the complexity of this friendship variation.

Third, there were potential skewness issues in certain outcome variables. For example, the pleasantness rating for the encounters may be substantially skewed among

older adults. Researchers should consider scaling the variables to handle the skewness. Fourth, this study could not isolate encounters with friends from the co-occurrence of other social encounters during the 3-hour period. It is possible that, an unpleasant experience with a social partner may negatively affect the concurrent or subsequent social experience with another social partner such as a friend.

As noted earlier, older adults may have close friends that they rarely contact in their daily lives but are crucial to their well-being. Future research should seek to differentiate effects of friends who are rarely encountered from friends that are encountered on a daily basis. Besides, researchers should also examine the potential mechanisms that explain the association between encounters with friends and emotional well-being. Indeed, the nature of the encounters with different social partners per se may influence older adults' daily experiences. For example, individuals usually perform routine daily tasks (e.g., daily cooking, bathing, dining) and receive intensive care from their spouses and family members (Litwin & Shiovitz-Ezra, 2010; Messeri et al., 1993) whereas friends often serve as companions for broader social activities (Huxhold et al., 2013; Rook & Ituarte, 1999). Therefore, future research should take into account the nature of the encounters and explore the possible mechanisms linking the association between encounters with friends and emotional well-being.

Lastly, the current study is the first study to explore how closeness of friendship influence older adults' well-being. Prior research suggested that cross-gender friendships may provide older adults different social experiences than same-gender friendships

(Baumgarte & Nelson, 2009); friends of similar age may bring happiness due to shared experiences (Gonzaga, 2009). As such, further research can examine other characteristics of friendships such as gender of friend, age of friend, and duration of friendships.

CONCLUSIONS

In sum, this study adds new evidence to support friends contribute differently to older adults' daily lives than other social partners. Specifically, encounters with friends were the most pleasant among all the social encounters and were less likely to have stressful experiences compared to encounters with spouses or family members. Lastly, encounters with friends were associated with increased positive mood throughout the day among older adults. Moreover, we examined the closeness of friendships and provided a window to understand the complexity of friendship. Practically speaking, practitioners can consider improving older adults' emotional well-being by encouraging or facilitating their older clients to engage more frequently with friends.

Table 1: Descriptive Information for Participants' Characteristics

	Participants (n = 313)		
	M	*SD*	*Range*
Demographics Characteristics			
Age	73.94	6.38	65–90
Self-rated health[a]	3.56	1.02	1–5
# of friends in social convoy	2.10	2.30	1–10
% of friends in social convoy[b]	.17	.21	0–1
		Proportions	
Female		.56	
Married[c]		.59	
Education			
No formal education		.01	
Elementary school		.02	
Some high school		.04	
High school		.08	
Some college		.28	
College graduate		.24	
Post college		.08	
Advanced degree		.25	
Ethnicity/race			
White		.69	
Black		.15	
Hispanic		.14	
Asian		.01	
American Indian		.01	

Notes. The range is the possible range value.
[a]Rated from 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [b]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles.
[c]Coded as 1 (*married* or *remarried*) and 0 (*not married*).

Table 2: Descriptive Information for Participants' Daily Experiences

	Participants (n = 313)		
	M	*SD*	*Range*
Daily Experiences			
Encounters with friends[a]	.31	.25	0–1
Encounters with spouses[b]	.59	.40	0–1
Encounters with family members[c]	.39	.31	0–1
Encounters with others[d]	.36	.22	0–1
Pleasantness[e]	4.61	0.43	1–5
Stressful experiences[f]	.11	.13	0–1
Positive mood[g]	3.44	0.71	1–5
Negative mood[h]	1.23	0.30	1–5
		Proportions	
Type of contact[i]			
In person		.22	
Via text		.10	
Via phone		.74	

Notes. The range is the possible range value. [a]The proportion of assessments in which older adults had encounters with friends. [b]The proportion of assessments in which older adults had encounters with spouses. [c]The proportion of assessments in which older adults had encounters with family members. [d]The proportion of assessments in which older adults had encounters with others. [e]Averaged rating of pleasantness of encounters, rated from 1 (*unpleasant*) to 5 (*pleasant*). [f]Averaged number of stressful experiences, coded as 1 (*stressful*) and 0 (*not stressful*). [g]Average of four positive mood items (e.g., love, content) every 3 hours, rated from 1 (*not at all*) to 5 (*a great deal*). [h]Average of five negative mood items (e.g., irritated, lonely, sad) every 3 hours, rated from 1 (*not at all*) to 5 (*a great deal*). [i]The proportion of encounters in which older adults had contact with social partners via three different types of contact.

Table 3: Bivariate Correlations between Participants' Characteristics and Daily Experiences (n = 313)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Daily experiences											
1. Encounters w. friends[a]	-										
2. Encounters w. spouses[b]	-.23***	-									
3. Encounters w. family[c]	-.08	-.04	-								
4. Encounters w. others[d]	.32***	-.11	.03	-							
5. Pleasantness[e]	.05	.07	.05	-.04	-						
6. Stressful experiences[f]	.03	-.12*	.01	.07	-.35***	-					
7. Positive mood[g]	.03	.10	.02	.04	.43***	-.24***	-				
8. Negative mood[h]	-.01	-.04	.11*	.04	-.30***	.34***	-.35***	-			
9. In person[i]	-.25***	.46***	-.13*	-.07	.17**	-.20***	.11	-.09	-		
10. Via text[j]	.29***	-.17**	-.43	.23***	-.17**	.17**	.03	-.03	-.50***	-	
11. Via phone[k]	.10	-.34***	.26***	-.04	-.12*	.13*	-.13*	.17**	-.77***	-.07	-
Characteristics											
12. Age	-.04	-.15**	.07	-.08	-.03	-.06	-.11	.00	-.06	-.23***	.18**
13. Gender[l]	-.12*	.38***	-.25***	-.16**	-.01	-.05	-.00	.03	.22***	-.13*	-.14*
14. Education[m]	.18**	.04	-.23***	.21***	-.06	.11	-.00	-.06	.00	.20**	-.14*
15. Self-rated health[n]	.12*	-.07	-.13*	.10	.18**	-.11*	.14*	-.27***	.04	.17**	-.19**
16. Marital status[o]	-.22***	.88***	-.18**	-.11	.09	-.12*	.13*	-.00	.43***	-.11	-.38***
17. Minority status[p]	-.13*	.09	.32***	-.12*	.03	-.15**	.03	.06	-.05	-.22***	.23***
18. % of friends[q]	.32***	-.15***	-.24***	.03	.00	.12*	.01	.00	-.09	.11	.00

Table 3: Bivariate Correlations between Participants' Characteristics and Daily Experiences (n = 313) – Continued

	12.	13.	14.	15.	16.	17.
Daily experiences						
1. Encounters w. friends[a]						
2. Encounters w. spouses[a]						
3. Encounters w. family[a]						
4. Encounters w. others[a]						
5. Pleasantness[b]						
6. Stressful experiences[c]						
7. Positive mood[d]						
8. Negative mood[d]						
9. In person[e]						
10. Via text[e]						
11. Via phone[e]						
Characteristics						
12. Age	-					
13. Gender[f]	.02	-				
14. Education[g]	-.07	.17**	-			
15. Self-rated health[h]	-.04	.04	.30***	-		
16. Marital status[i]	-.23***	.40***	.16**	.03	-	
17. Minority status[j]	-.12*	-.00	-.36***	-.35***	-.01	-
18. % of friends[k]	.06	.07	.09	.04	-.17**	-.20***

[a]The proportion of assessments in which older adults had encounters with friends, spouses, family, and others. [b]Averaged pleasantness of the encounters, 1 (*unpleasant*) to 5 (*pleasant*). [c]Averaged number of stressful experiences, coded as 1 (*stressful*) and 0 (*not stressful*). [e]Average of five mood items every 3 hours, 1 (*not at all*) to 5 (*a great deal*). [e]The proportion of encounters in which older adults had in-person contact, via text, and via phone. [f]1 (*Male*) and 0 (*Female*). [g]1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [h]1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [i]1 (*married* or *remarried*) and 0 (*not married*). [j]1 (*ethnic or racial minority*) and 0 (*non-Hispanic Whites*). [k]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 4: Multilevel Linear Models Predicting Pleasantness of Encounters throughout the Day from Encounters with Different Social Partners

Variable	*B*	*SE*
Fixed effects		
Intercept	4.70***	0.03
Relationship types[a]		
Friend	(Ref.)	(Ref.)
Spouse	-0.04**	0.02
Family member	-0.06***	0.02
Other social partner	-0.23***	0.02
Covariates		
Age	0.00	0.00
Gender[b]	-0.01	0.05
Education[c]	-0.02	0.02
Health[d]	0.10***	0.03
Minority status[e]	0.05	0.06
% of friends in social convoy[f]	0.04	0.12
Random effects		
Intercept VAR (Level 2: Assessment)	0.17***	0.01
Intercept VAR (Level 3: Participant)	0.15***	0.01
Residual VAR	0.32***	0.00
-2 log likelihood	34441.9	

Notes. Encounters n =17,499 from 313 participants. Pleasantness of encounters was a continuous variable coded from 1 (*unpleasant*) to 5 (*pleasant*). [a]The predictor was a categorical variable that represented different social partners which was recoded as four dummy variables (i.e., an encounter with: a friend, a spouse, a family member (e.g., parents, child, sibling), and another person). [b]Coded as (*Male*) and 0 (*Female*). [c]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [d]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [f]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles. *p < .05. **p < .01. ***p < .001.

Table 5: Tukey Pairwise Comparisons for Different Types of Relationships Predicting Pleasantness of Encounters and Stressful Experiences (n = 313)

(*I*) Relationship Type	(*J*) Relationship Type	Pleasantness		Stressful experiences	
		Mean Differences (*I-J*)	*SE*	Mean Differences *(I-J)*	*SE*
Spouses	Family members	0.01	0.01	0.09	0.08
	Other social partners	0.19***	0.01	0.58***	0.09
Family members	Other social partners	0.17***	0.02	0.68***	0.09

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 6: Multilevel Logistic Models Predicting Stressful Experiences throughout the Day from Encounters with Different Social Partners

Variable	*B*	*SE*	*OR*	*Log Odds*
Fixed effects				
Intercept	-2.71***	0.10		
Relationship types[a]				
Friend	(Ref.)	(Ref.)		
Spouse	0.20*	0.09	1.22	0.20
Family member	0.29**	0.09	1.34	0.29
Other social partner	-0.38***	0.09	0.68	-0.39
Covariates				
Age	-0.03*	0.01	0.98	-0.02
Gender[b]	-0.25	0.15	0.78	-0.25
Education[c]	0.09	0.05	1.10	0.10
Health[d]	-0.25**	0.08	0.78	-0.25
Minority status[e]	-0.67***	0.19	0.51	-0.67
% of friends in social convoy[f]	0.49	0.38	1.64	0.49
Random effects				
Intercept VAR (Level 2: Assessment)	1.29***	0.08		
Intercept VAR (Level 4: Participant)	1.11***	0.14		
-2 (pseudo) log likelihood		90451.9		

Notes. Encounters *n* =17,499 from 313 participants. Stressful experience was a dichotomous variable coded 1 (*stressful experience*) and 0 (*no stressful experience*). [a]The predictor was a categorical variable that represented different social partners which was recoded as four dummy variables (i.e., an encounter with: a friend, a spouse, a family member (e.g., parents, child), and another person). [b]Coded as (*Male*) and 0 (*Female*). [c]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [d]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [f]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles. *$p < .05$. **$p < .01$. ***$p < .001$

Table 7: Multilevel Linear Models Predicting Participants' Mood throughout the Day from Encounters with Different Social Partners

	Positive mood		Negative mood	
Variable	*B*	*SE*	*B*	*SE*
Fixed effects				
Intercept	3.39***	0.05	1.21***	0.02
Relationship types[a]				
Friend	0.08***	0.01	-0.01	0.01
Spouse	0.04*	0.02	0.02	0.01
Family member	0.05***	0.01	0.01	0.01
Other social partner	0.00	0.01	0.01	0.01
Covariates				
Age	-0.01	0.01	-0.00	0.00
Gender[b]	0.00	0.08	0.02	0.03
Education[c]	-0.02	0.03	0.00	0.01
Health[d]	0.12***	0.04	-0.08***	0.02
Minority status[e]	0.08	0.10	-0.03	0.04
% of friends in social convoy[f]	0.07	0.21	0.03	0.08
Random effects				
Intercept VAR (Level 2: Participant)	0.48***	0.04	0.08***	0.01
Residual VAR	0.17***	0.00	0.06***	0.00
-2 log likelihood	7585.8		1404.5	

Notes. Assessments n = 6,262 from 313 participants.

[a]Each relationship type (i.e., four dichotomous variables representing any encounters with: friends, spouses, family members, and other social partners) was entered as the predictor. [b]Coded as (*Male*) and 0 (*Female*). [c]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [d]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [f]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles.

*p < .05. **p < .01. ***p < .001.

Table 8: Pairwise Comparisons Using t-tests for Different Types of Relationships Predicting Older Adults' Mood (n = 313)

Relationship types in comparison		Positive mood		Negative mood	
		B	*SE*	*B*	*SE*
Friend	Spouses	0.04	0.02	-0.03	0.01
	Family members	0.02	0.02	-0.02	0.01
	Other social partners	0.08***	0.01	-0.02	0.01
Spouses	Family members	-0.01	0.02	-0.00	0.01
	Other social partners	0.04*	0.02	0.01	0.01
Family members	Other social partners	0.06**	0.02	0.00	0.01

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 9:Multilevel Linear Models Predicting Participants' Mood throughout the Day from Closeness of Friendships

	Positive mood		Negative mood	
Variable	*B*	*SE*	*B*	*SE*
Fixed effects				
Intercept	3.39***	0.05	1.21***	0.02
Closeness of friendship[a]				
Social convoy	0.02	0.02	0.01	0.01
Outside social convoy	0.09***	0.01	-0.02*	0.01
Spouses[b]	0.04*	0.02	0.02	0.01
Family members[c]	0.06***	0.01	0.01	0.01
Other social partners[d]	0.00	0.01	0.01	0.01
Covariates				
Age	-0.01	0.01	0.00	0.00
Gender[e]	0.00	0.08	0.02	0.03
Education[f]	-0.02	0.03	0.00	0.01
Health[g]	0.12**	0.04	-0.08***	0.02
Minority status[h]	0.08	0.10	-0.03	0.04
% of friends in social convoy[i]	0.09	0.21	0.02	0.09
Random effects				
Intercept VAR (Level 2: Participant)	0.48***	0.04	0.07***	0.01
Residual VAR	0.17***	0.01	0.07***	0.00
-2 log likelihood	7583.0		1407.4	

Notes. Assessments n = 6,262 from 313 participants. [a]Dichotomous variables representing any encounters with friends: in social convoy and outside social convoy were entered as the predictors. [b]A dichotomous variable representing any encounters with spouses during the 3-hour period. [c]A dichotomous variable representing any encounters with family members during the 3-hour period. [d]A dichotomous variable representing any encounters with other social partners during the 3-hour period. [e](*Male*) and 0 (*Female*). [f]1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [g]1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [h]1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [i]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles. *p < .05. **p < .01. ***p < .001.

Table 10: Pairwise Comparisons Using t-tests for Different Closeness of Friendships and Different Types of Social Relationships Predicting Older Adults' Mood (n = 313)

Different relationships in comparison		Positive mood		Negative mood	
		B	*SE*	*B*	*SE*
Social convoy friends	Non-convoy friends	-0.07**	0.02	0.03	0.02
	Spouses	-0.02	0.03	-0.01	0.02
	Family members	-0.04	0.02	0.00	0.01
	Other social partners	0.02	0.02	0.00	0.01
Non-convoy friends	Spouses	0.05*	0.02	-0.04**	0.01
	Family members	0.04	0.02	-0.03**	0.01
	Other social partners	0.10***	0.02	-0.03**	0.01
Spouses	Family members	-0.02	0.02	0.01	0.01
	Other social partners	0.04	0.02	0.01	0.01
Family members	Other social partners	0.06**	0.02	0.00	0.01

Notes. Closeness of friendships are based on the circle placement.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 11: Multilevel Linear Models Predicting Pleasantness of Encounters throughout the Day from Encounters with Different Social Partners Using Subsample of Participants who Encountered at Least One Friend During the Study Period (n = 286)

Variable	*B*	*SE*
Fixed effects		
Intercept	4.74***	0.03
Relationship types[a]		
Friend	(Ref.)	(Ref.)
Spouses	-0.05**	0.02
Family member	-0.06***	0.02
Other social partner	-0.23***	0.02
Covariates		
Age	0.00	0.00
Gender[b]	0.01	0.05
Education[c]	-0.02	0.02
Health[d]	0.10***	0.02
Minority status[e]	0.09	0.06
% of friends in social convoy[f]	-0.03	0.12
Random effects		
Intercept VAR (Level 2: Assessment)	0.16***	0.01
Intercept VAR (Level 3: Participant)	0.13***	0.01
Residual VAR	0.32***	0.00
-2 log likelihood	32280.7	

Notes. Encounters *n* =16,488 from 286 participants. Pleasantness of encounters was a continuous variable 1 (*unpleasant*) to 5 (*pleasant*). [a]The predictor was a categorical variable that represented different social partners which was recoded as four dummy variables [b]1 (*Male*) and 0 (*Female*). [c]1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [d] 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [f]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 12: Multilevel Logistic Models Predicting Stressful Experiences throughout the Day from Encounters with Different Social Partners Using Subsample of Participants who Encountered at Least One Friend During the Study Period (n = 286)

Variable	*B*	*SE*	*OR*	*Log Odds*
Fixed effects				
Intercept	-2.75***	0.11		
Relationship types[a]				
Friend	(Ref.)	(Ref.)		
Spouses	0.16	0.09	1.17	0.16
Family member	0.30**	0.10	1.35	0.30
Other social partner	-0.37***	0.09	0.69	-0.37
Covariates				
Age	-0.03*	0.01	0.97	-0.01
Gender[b]	-0.30	0.15	0.74	-0.30
Education[c]	0.14	0.05	1.15	0.14
Health[d]	-0.30**	0.08	0.74	-0.30
Minority status[e]	-0.72***	0.19	0.49	-0.71
% of friends in social convoy[f]	0.56	0.38	1.75	0.56
Random effects				
Intercept VAR (Level 2: Assessment)	1.27***	0.09		
Intercept VAR (Level 4: Participant)	1.04***	0.13		
-2 (pseudo) log likelihood		85313.83		

Notes. Encounters *n* =16,488 from 286 participants. Stressful experience coded 1 (*stressful experience*) and 0 (*no stressful experience*). [a]The predictor was a categorical variable that represented different social partners which was recoded as four dummy variables (i.e., an encounter with: a friend, a spouse, a family member (e.g., parents, child), and another person). [b]Coded as (*Male*) and 0 (*Female*). [c]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [d]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [f]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles. **p* < .05. ***p* < .01. ****p* < .001.

Table 13: Tukey Pairwise Comparisons for Different Types of Relationships Predicting Pleasantness of encounters and Stressful Experiences Using Subsample of Participants who Encountered at Least One Friend During the Study Period (n = 286)

		Pleasantness		Stressful experiences	
(*I*) Relationship Type	(*J*) Relationship Type	Mean Differences (*I-J*)	*SE*	Mean Differences (*I-J*)	*SE*
Spouses	Family members	0.01	0.01	0.14	0.11
	Other social partners	0.18***	0.01	0.52***	0.11
Family members	Other social partners	0.17***	0.02	0.66***	0.12

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 14: Multilevel Linear Models Predicting Participants' Mood throughout the Day from Encounters with Different Social Partners Using Subsample of Participants who Encountered at Least One Friend During the Study Period (n = 286)

	Positive mood		Negative mood	
Variable	*B*	*SE*	*B*	*SE*
Fixed effects				
Intercept	3.45***	0.05	1.20***	0.02
Relationship types[a]				
Friend	0.08***	0.01	-0.01	0.01
Spouses	0.04*	0.02	0.02	0.01
Family member	0.05***	0.01	0.02	0.01
Other social partner	0.00	0.01	0.01	0.01
Covariates				
Age	-0.01	0.01	0.00	0.00
Gender[b]	0.00	0.09	0.01	0.03
Education[c]	-0.03	0.03	0.01	0.01
Health[d]	0.15**	0.04	-0.09***	0.02
Minority status[e]	0.16	0.10	-0.04	0.04
% of friends in social convoy[f]	-0.04	0.21	0.06	0.08
Random effects				
Intercept VAR (Level 2: Participant)	0.46***	0.04	0.07***	0.01
Residual VAR	0.17***	0.00	0.06***	0.00
-2 log likelihood	7082.5		1352.6	

Notes. Assessments n = 5,847 from 286 participants. [a]Each relationship type (i.e., four dichotomous variables representing any encounters with: friends, spouses, family members, and other social partners) was entered as the predictor. [b]Coded as (*Male*) and 0 (*Female*). [c]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [d]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [f]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles. *p < .05. **p < .01. ***p < .001.

Table 15: Pairwise Comparisons for Different Types of Relationships Predicting Older Adults' Mood Using Subsample of Participants who Encountered at Least One Friend During the Study Period (n = 286)

Relationship types in comparison		Positive mood		Negative mood	
		B	*SE*	*B*	*SE*
Friend	Spouses	0.04	0.02	-0.03	0.01
	Family members	0.03	0.02	-0.02*	0.01
	Other social partners	0.08***	0.02	-0.02	0.01
Spouses	Family members	-0.01	0.03	0.00	0.02
	Other social partners	0.04	0.02	0.01	0.01
Family members	Other social partners	0.05**	0.02	0.01	0.01

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 16: Multilevel Linear Models Predicting Pleasantness of Encounters throughout the Day from Encounters with Different Social Partners Using Subsample of Participants who Had Listed at Least One Friend in Their Social Convoys (n = 193)

Variable	*B*	*SE*
Fixed effects		
Intercept	4.72***	0.04
Relationship types[a]		
Friend	(Ref.)	(Ref.)
Spouses	-0.04*	0.02
Family member	-0.08***	0.02
Other social partner	-0.25***	0.02
Covariates		
Age	0.00	0.00
Gender[b]	0.02	0.06
Education[c]	-0.03	0.02
Health[d]	0.10***	0.03
Minority status[e]	0.11	0.08
% of friends in social convoy[f]	0.10	0.15
Random effects		
Intercept VAR (Level 2: Assessment)	0.18***	0.01
Intercept VAR (Level 3: Participant)	0.13***	0.02
Residual VAR	0.33***	0.01
-2 log likelihood	20862.9	

Notes. Encounters n = 10,342 from 193 participants. Pleasantness of encounters coded from 1 (*unpleasant*) to 5 (*pleasant*). [a]The predictor was a categorical variable that represented different social partners which was recoded as four dummy variables. [b]1 (*Male*) and 0 (*Female*). [c]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [d]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [f]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles. *p < .05. **p < .01. ***p < .001.

Table 17: Multilevel Logistic Models Predicting Stressful Experiences throughout the Day from Encounters with Different Social Partners Using Subsample of Participants who Had Listed at Least One Friend in Their Social Convoys (n = 193)

Variable	*B*	*SE*	*OR*	*Log Odds*
Fixed effects				
Intercept	-2.71***	0.14		
Relationship types[a]				
Friend	(Ref.)	(Ref.)		
Spouses	0.29*	0.11	1.33	0.29
Family member	0.39***	0.12	1.48	0.39
Other social partner	-0.37***	0.11	0.69	-0.37
Covariates				
Age	-0.03*	0.02	0.97	-0.03
Gender[b]	-0.39	0.20	0.68	-0.39
Education[c]	0.13	0.07	1.14	0.13
Health[d]	-0.31**	0.10	0.74	-0.30
Minority status[e]	-0.62***	0.25	0.54	-0.62
% of friends in social convoy[f]	0.35	0.49	1.43	0.36
Random effects				
Intercept VAR (Level 2: Assessment)	1.23***	0.10		
Intercept VAR (Level 4: Participant)	1.14***	0.17		
-2 (pseudo) log likelihood		52990.53		

Notes. Encounters *n* =10,342 from 193 participants. Stressful experience was a dichotomous variable coded 1 (*stressful experience*) and 0 (*no stressful experience*). [a]The predictor was a categorical variable that represented different social partners which was recoded as four dummy variables (i.e., an encounter with: a friend, a spouse, a family member (e.g., parents, child), and another person). [b]Coded as (*Male*) and 0 (*Female*). [c]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [d]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [f]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 18: Tukey Pairwise Comparisons for Different Types of Relationships Predicting Pleasantness of encounters and Stressful Experiences Using Subsample of Participants who Had Listed at Least One Friend in Their Social Convoys (n = 193)

		Pleasantness		Stressful experiences	
(*I*) Relationship Type	(*J*) Relationship Type	Mean Differences (*I-J*)	*SE*	Mean Differences (*I-J*)	*SE*
Spouses	Family members	0.04*	0.02	0.11	0.11
	Other social partners	0.21***	0.02	0.66***	0.11
Family members	Other social partners	0.16***	0.02	0.77***	0.12

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 19: Multilevel Linear Models Predicting Participants' Mood throughout the Day from Encounters with Different Social Partners Using Subsample of Participants who Had Listed at Least One Friend in Their Social Convoys (n = 193)

	Positive mood		Negative mood	
Variable	*B*	*SE*	*B*	*SE*
Fixed effects				
Intercept	3.50***	0.07	1.18***	0.03
Relationship types[a]				
Friend	0.09***	0.02	-0.01	0.01
Spouses	0.06*	0.03	0.01	0.01
Family member	0.04*	0.02	0.02	0.01
Other social partner	0.00	0.02	0.02	0.01
Covariates				
Age	-0.01	0.01	0.00	0.00
Gender[b]	0.02	0.11	0.02	0.04
Education[c]	-0.03	0.04	0.00	0.01
Health[d]	0.13***	0.05	-0.08***	0.02
Minority status[e]	0.21	0.14	-0.08	0.05
% of friends in social convoy[f]	-0.25	0.27	0.08	0.09
Random effects				
Intercept VAR (Level 2: Participant)	0.47***	0.05	0.06***	0.01
Residual VAR	0.18***	0.00	0.06***	0.00
-2 log likelihood	4969.8		667.9	

Notes. Assessments n = 3,908 from 193 participants. [a]Each relationship type (i.e., four dichotomous variables representing any encounters with: friends, spouses, family members, and other social partners) was entered as the predictor. [b]Coded as (*Male*) and 0 (*Female*). [c]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [d]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [f]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles. *p < .05. **p < .01. ***p < .001.

Table 20: Pairwise Comparisons for Different Types of Relationships Predicting Older Adults' Mood Using Subsample of Participants who Had Listed at Least One Friend in Their Social Convoys (n = 193)

Relationship types in comparison		Positive mood		Negative mood	
		B	*SE*	*B*	*SE*
Friend	Spouses	0.03	0.03	-0.03	0.02
	Family members	0.05	0.02	-0.03*	0.01
	Other social partners	0.09***	0.02	-0.03*	0.01
Spouses	Family members	0.02	0.03	-0.01	0.02
	Other social partners	0.06*	0.03	0.00	0.02
Family members	Other social partners	0.05	0.02	0.00	0.01

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 21: Multilevel Linear Models Predicting Participants' Mood throughout the Day from Encounters with Different Social Partners Using Subsample of Participants who Had Encounters with at Listed One Social Partner During the 3-hour Assessment Interval

	Positive mood		Negative mood	
Variable	*B*	*SE*	*B*	*SE*
Fixed effects				
Intercept	3.42***	0.05	1.21***	0.02
Relationship types[a]				
Friend	0.07***	0.01	-0.01	0.01
Spouses	0.03	0.02	0.02	0.01
Family member	0.04*	0.01	0.01	0.01
Other social partner	-0.01	0.01	0.01	0.01
Covariates				
Age	-0.01	0.01	0.00	0.00
Gender[b]	0.00	0.08	0.02	0.03
Education[c]	-0.02	0.03	0.00	0.01
Health[d]	0.12***	0.04	-0.08***	0.02
Minority status[e]	0.07	0.10	-0.03	0.04
% of friends in social convoy[f]	0.03	0.21	0.01	0.09
Random effects				
Intercept VAR (Level 2: Participant)	0.49***	0.04	0.08***	0.01
Residual VAR	0.16***	0.00	0.06***	0.00
-2 log likelihood	6693.0		1286.9	

Notes. Participants n = 309, assessments n = 5,463.

[a]Each relationship type (i.e., four dichotomous variables representing any encounters with: friends, spouses, family members, and other social partners) was entered as the predictor. [b]Coded as (*Male*) and 0 (*Female*). [c]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [d]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [f]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all the social convoy circles.

*p < .05. **p < .01. ***p < .001.

Table 22: Pairwise Comparisons for Different Types of Relationships Predicting Older Adults' Mood Using Subsample of Participants who Had Encounters with at Listed One Social Partner During the 3-hour Assessment Interval

Relationship types in comparison		Positive mood		Negative mood	
		B	*SE*	*B*	*SE*
Friend	Spouses	0.04	0.02	-0.03*	0.01
	Family members	0.03	0.02	-0.02	0.01
	Other social partners	0.08***	0.02	-0.02	0.01
Spouses	Family members	-0.01	0.03	0.01	0.02
	Other social partners	0.04*	0.02	0.01	0.01
Family members	Other social partners	0.05	0.02	0.00	0.01

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 23: Multilevel Linear Models Predicting Older Adults' Pleasantness and Stressful Experiences throughout the Day from Encounters with Friends: Marital Status as a Moderator

	Pleasantness		Stressful Experiences	
Variable	*B*	*SE*	*B*	*SE*
Fixed effects				
Intercept	4.51***	0.04	-2.53***	0.14
Encounters with friends[a]	0.16***	0.02	0.06	0.11
Marital status	0.14*	0.06	-0.20	0.17
Encounters with friends[a] × marital status[b]	-0.06*	0.03	-0.13	0.16
Covariates				
Age	0.00	0.00	-0.03	0.01
Gender[b]	-0.04	0.05	-0.12	0.16
Education[c]	-0.03	0.02	0.08	0.05
Health[d]	0.10**	0.03	-0.26***	0.08
Minority status[e]	0.08	0.06	-0.64***	0.18
% of friends in social convoy[f]	0.07	0.13	0.23	0.38
Random effects				
Intercept VAR (Level 2: Assessment)	0.17***	0.01	1.29***	0.08
Intercept VAR (Level 3: Participant)	0.15***	0.01	1.08***	0.13
Residual VAR	0.32***	0.00	-	
-2 log likelihood	34625.3		90055.62	

Notes. Assessments n = 6,262 from 313 participants.

[a]Had social encounters with friends. [b]Coded as 1 (*married* or *remarried*) and 0 (*not married*). [c]Coded as (*Male*) and 0 (*Female*). [d]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [e]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [f]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [g]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all social convoy circles.

*p < .05. **p < .01. ***p < .001.

Table 24: Multilevel Linear Models Predicting Older Adults' Mood throughout the Day from Encounters with Friends: Marital Status as a Moderator

	Positive mood		Negative mood	
Variable	*B*	*SE*	*B*	*SE*
Fixed effects				
Intercept	3.25***	0.07	1.23***	0.03
Encounters with friends[a]	0.13***	0.02	-0.02	0.01
Marital status[b]	0.27**	0.09	-0.02	0.04
Encounters with friends[a] × marital status[b]	-0.09***	0.03	0.02	0.02
Encounters with family members[c]	0.06***	0.01	0.01	0.01
Encounters with other social partners[d]	0.00	0.01	0.01	0.01
Covariates				
Age	-0.01	0.01	0.00	0.00
Gender[e]	-0.08	0.09	0.03	0.04
Education[f]	-0.03	0.03	0.00	0.01
Health[g]	0.12**	0.04	-0.08***	0.02
Minority status[h]	0.10	0.10	-0.03	0.04
% of friends in social convoy[i]	0.17	0.21	0.01	0.09
Random effects				
Intercept VAR (Level 2: Participant)	0.47***	0.04	0.08***	0.01
Residual VAR	0.17***	0.00	0.06***	0.00
-2 log likelihood	7574.3		1409.2	

Notes. Assessments n = 6,262 from 313 participants. Encounters with spouses were not included in the model due to high correlation with marital status. [a]Had social encounters with friends. [b]Coded as 1 (*married* or *remarried*) and 0 (*not married*). [c]Had social encounters with family members. [d]Had social encounters with other social partners. [e]Coded as (*Male*) and 0 (*Female*). [f]Coded as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [g]Coded as 1(*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [h]Coded as 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). [i]The number of friends participants listed in the top 10 divided by the total number of social partners listed in all social convoy circles.
*p < .05. **p < .01. ***p < .001.

Figure 1: Interaction Effects of Encounters with Friends × Marital Status on Older Adults' Rating of Pleasantness Throughout the Day

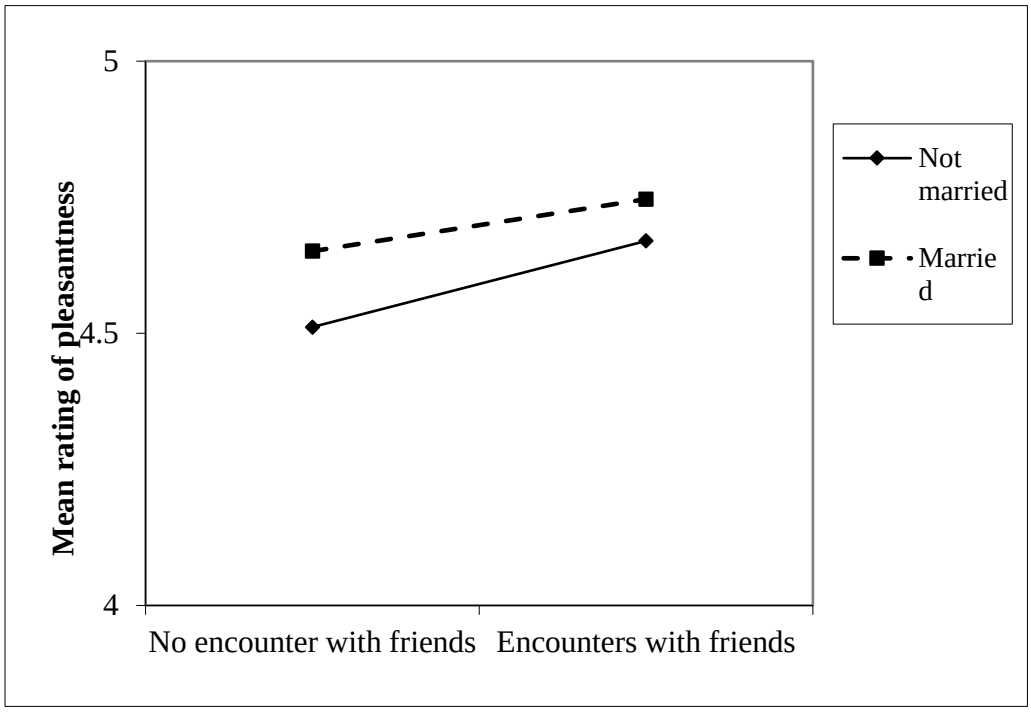
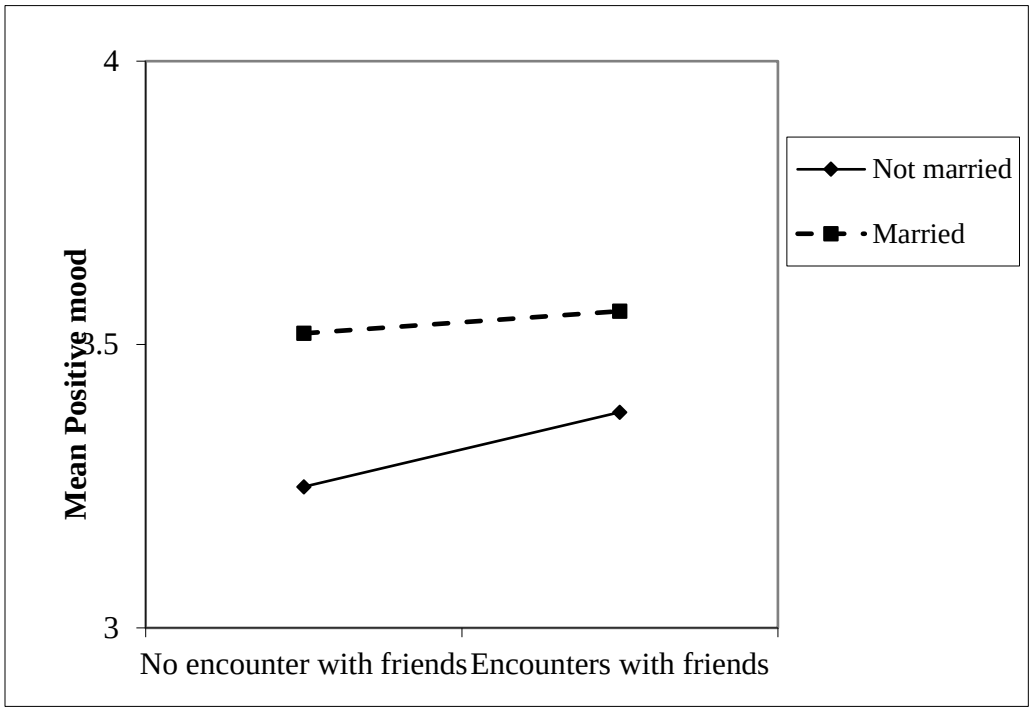


Figure 2: Interaction Effects of Encounters with Friends × Marital Status on Older Adults' Positive Mood Throughout the Day.



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